

REMARKS

The Office Action mailed August 15, 2006 has been carefully considered. Claims 1-3 and 14 have been amended. The application still contains Claims 1-3 and 5-14 and no fee is due for the claims. However, applicant hereby petitions for a three-month extension of time under 37 CFR 1.136. The fee for such petition is enclosed.

In the Office Action, the Examiner rejected claims 1-3 and 5-8 under 35 U.S.C. §103(a) as being unpatentable over Nilsson (U.S. Patent App. Pub. No. 2003/0122719) in view of Dean (U.S. Patent No. 6,091,970). Claims 9-13 were rejected under 35 U.S.C. §103(a) as being unpatentable over Nilsson in view of Dean, and further in view of Shields et al. (U.S. Patent No. 7,043,280). Finally, claim 14 was rejected under 35 U.S.C. §103(a) as being unpatentable over Nilsson et al. in view of Dean and further in view of Shields et al.

Applicant respectfully disagrees with the conclusions reached by the Examiner relative to any of the references cited or any combination thereof. Specifically, the Examiner's reliance on the combination of Nilsson et al. and Dean is unfounded. With respect to claim 1, there is neither any teaching or suggestion in either Nilsson et al. or Dean to provide any type of graceful degradation against failure in the transmitter path. As an example, if there is any failure in the transmitter of either Nilsson et al. or Dean, the communication service will be lost completely. In the device as currently claim in claim 1, amended, communication coverage is still maintained when there is a failure in either the primary or the secondary port.

Regarding claims 2 and 3, Nilsson et al. does not disclose that each antenna element provides 120 degrees continuous azimuth angular coverage. Nilsson's three element antenna configuration is only physically spaced 120 degrees circumferentially apart at the first ends of the antenna array. The second ends of this three antenna elements are all tied together to a

common point at the apex of his imaginary cone. Furthermore, Nilsson's three antenna elements are slanted at an acute angle relative to the ground plan. With Nilsson's antenna configuration, the antenna's main lobe is slanted upward with respect to the horizontal plane as shown in Figures 4 & 5 of his patent. The end user that is located in the lower elevation angle with respect to the horizontal plane (notch of the antenna beamwidth) would not be able to communicate reliably with the base station. Especially for the maritime application, where the ship is constantly in a pitch and roll motion, the communication link will not be reliable and frequent service outage. In the invention described in the present application, the antenna elements are mounted perpendicular to the antenna base. By utilizing this type of configuration, applicant is able to offer reliable communication service in 360 degrees azimuth and 40 degrees elevation coverage to the end users. Due to applicant's antenna system's wide beamwidth coverage, communication link will not be impacted by the ship's pitch and roll motion.

With respect to the rejection of claim 5, all three antennas in the Dean reference are connected to either a common power divider or a switch in the primary transmit path. No secondary transmit paths are provided in Dean. Regarding claims 6 and 7, Dean requires a fairly complicated and expensive way of providing amplification to each of the antenna elements. A minimum of 6 amplifiers, 3 duplexers and 2 power dividers are needed to accomplish transmit and receive function. Applicant, however, is able to provide transmit and receive amplification for all three antenna elements with just three bi-directional amplifiers and one power divider. Applicant's invention therefore provides a simpler, lower cost solution and more reliable approach.

With respect to claim 8, the transmit switch implementation shown in Dean's Figure 4.0 will only allow one of the three antenna elements to be active at any given time. The end users

would have to determine which sector antenna element they want to transmit the signal from. The transmit switch in figure 4.0 does not have any function with respect to receive operation. Regarding claims 9, 10 & 11, Shields power solution is limited to indoor application only. This type of AC to DC power solution will not be able to withstand the harsh saltwater spray outdoor environment that the maritime radio system must be able to withstand. In addition, the Shields power solution is limited in the distance separation between his antenna system and the available AC outlet for his transformer/LAN block. Typically, the power cord for the AC transformer is usually between 6 to 8 feet in length. In applicant's DC power distribution solution, applicant is not limited to the distance of 6 to 8 feet. In fact, with its weatherproof integrated power and communication cabling solution, applicant is able to locate its complete antenna system out in the harsh salt water environment and up to 300 feet away from the available power source.

As to the rejection of claim 12, applicant argues that it is not obvious for one of ordinary skill to use CAT-5 cable for high signal integrity unless their radio has built-in Ethernet jack. Many of the radios utilize RS232 serial communication protocol. The typical RS232 cable distance that can run is limited to approximately 15 meters. By using the Cat-5 cabling, applicant able to extend that distance from 15 meters to approximately 100 meters between the radio system and customer's LAN network. With respect to the rejection of claim 13, Shields does not provide any teaching of using a single pair of shielded 12 gauge wire for DC power.

Finally, applicant incorporates all of the arguments presented herein with regard to the rejection of claim 14. Specifically, Nilsson's antenna system does not provide any means of graceful degradation in the case of transmitter failure. Since applicant's antenna system provide a primary and a secondary transmit paths, a failure in the transmitter will not cause lost of communication service completely. Since Nilsson's three elements antenna are all slanted and

are all connected at one ends of each elements to form an apex of a cone shape. With this type of antenna configuration, it is in certain that the end users will be able to communicate with the base station reliably if it is near the horizontal plane of the antenna beam. Dean's patent does not teach the usage of the primary and the secondary port for the transmit function. Similar to Nilsson's antenna system, any failure in the transmitter path, between transmitter and the splitter, will cause lost of communication link completely. Dean's system may indeed incorporate amplifier in both the transmitter and the receiver paths. However, it should be noted that a total of 9 coaxial cables are needed to interconnect his transmitter and receiver amplifiers to the three elements antenna. In applicant's antenna system, only three coaxial cables are used to interconnect its antenna elements to the amplifiers. Applicant's antenna system is much simpler, lower cost and higher reliability compared to the Dean's antenna system.

It should be appreciated that for maritime application, the radio system must be reliable, able to operate in the harsh saltwater environment and able to be mounted high up on the ship's antenna mast for the best possible reception. With these type of requirements, a true Maritime radio antenna system must be environmentally sealed and allow the users to install the antenna far away from the ship's indoor equipment. Shields patent does teach the use of environmental sealed for his antenna elements and drive motor. However, his AC power transformer/LAN block is not embedded inside of this environmental sealed housing. Since his antenna system is dependent on the DC power supplied by the transformer/LAN block, his antenna system is restricted in terms of mounting distance away from the available AC outlet. On a ship, there are no AC outlets readily available outside of the cabinet. With this type of limitation, his antenna system will not be able to be mounted near the top of the antenna mast for best possible signal reception.

For the above-stated reasons, applicant submits that the amended claims of the instant application patentably distinguish over the references cited by the Examiner taken alone or in combination, and are now in condition for immediate allowance for the same reasons as claim 1 (amended).

In light of the amendments and remarks, applicant respectfully submits that this application is now in condition for allowance, and an early Notice of Allowance is hereby respectfully requested.

Respectfully submitted,

A handwritten signature in black ink, appearing to read 'James G. Coplit', is written over a horizontal line.

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